

Application No. 10/790,509  
Amendment dated February 28, 2008  
Reply to Office Action of January 28, 2008

### REMARKS/ARGUMENTS

Applicant has carefully reviewed and considered the Office Action mailed on January 28, 2008, and the references cited therewith.

Claims 1, 8, 13, 19, and 22-23 are amended, and no claims are canceled or added; as a result, claims 1-23 are now pending in this application.

#### § 101 Rejection of the Claims

Claim 23 was rejected under 35 USC § 101 because the claimed invention was allegedly directed to non-statutory subject matter. Applicant respectfully traverses the rejection as follows.

Applicant believes that the currently amended preamble to independent claim 23 overcomes the 101 rejection by reciting tangible elements and instructions that are executed to "produce concrete, useful and tangible results". Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 101 rejection of independent claim 23, as currently amended.

#### § 102 Rejection of the Claims

Claims 13-16 were rejected under 35 USC § 102(e) as allegedly being anticipated by Arimilli et al. (U.S. Patent No. 6,907,494). Applicant respectfully traverses the rejection as follows.

Applicant does not admit that the Arimilli reference is indeed prior art and reserves the right to swear behind at a later date. Nonetheless, in the interest of advancing prosecution thereof, Applicant respectfully submits that the elements and limitations of the claims of the present disclosure are patentably distinguishable from the teachings of the Arimilli reference for at least the following reasons.

Applicant's independent claim 13, as currently amended, presently recites:

means for unmapping a virtual address space for a process that is triggered as a physical address space used by the process is being released, in a manner which does not violate semantics for an operating system of the computing device, when a removable memory mappable device associated with the process is logically disconnected.

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Applicant respectfully submits that the Arimilli reference does not teach unmapping a virtual address space for a process that is triggered as a physical address space used by the process is being released, in a manner which does not violate semantics for an operating system of the computing device, when a removable memory mappable device associated with the process is logically disconnected.

That is, the Arimilli reference appears to describe, "A processor contains a move engine and a memory controller contains a mapping engine that, together, transparently reconfigure physical memory to accomplish addition, subtraction, or replacement of a memory module." (Abstract). The reference further appears to describe in column 7, lines 52-57:

Processor unit 10 notifies move engine 28 and mapping engines 26, 36, 46 that memory module M2 is being removed from physical memory 22. Move engine immediately selects the remaining module or modules that will be used to store the data contained in memory module M2.

As such, Applicant respectfully submits that each and every element and limitation of independent claim 13, as currently amended, is not present in the Arimilli reference. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 102 rejection of independent claim 13, as currently amended, as well as those claims that depend therefrom.

#### §103 Rejection of the Claims

Claims 1-12, 17-23 were rejected under 35 USC § 103(a) as being allegedly unpatentable over Arimilli et al. (U.S. Patent No. 6,907,494) in view of Dirks (U.S. Patent No. 6,119,214). Applicant respectfully traverses the rejection as follows.

The Examiner acknowledged in the January 28, 2008, Office Action that "Arimilli differs from the claimed invention in not specifically teaching to register that the virtual address space, previously available to the process, is no longer valid for process use subsequent to when the physical space is released."

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From Applicant's review, the Dirks reference does not cure the deficiencies of the Arimilli reference. That is, the Dirks reference does not appear to describe, teach, or suggest:

program instructions provided to the memory and executable by the processor to:

\* \* \*

register by providing an indication in the virtual memory data structure for the process that the virtual address space, previously available to the process, is no longer valid for process use;

wherein registering is triggered by detection that the physical address space that was being used by processes associated with the device has been released; and

wherein the registering occurs as the physical address space is released and before release of the virtual address space by the process.

as recited in Applicant's independent claim 1, as currently amended.

In contrast, the Dirks reference appears to describe, as stated in the Abstract:

Each time that a new address is allocated to a program, a limited number of entries in the page table are examined, to determine whether the addresses associated with those entries are no longer in use, and the entries can be removed from the page table.

The Abstract goes on to state, "As a result, a constant supply of free addresses are provided with only a limited amount of processing time at regular intervals during the operation of a computer." Moreover, the Dirks reference appears to describe, "After all of the entries in the page table have been examined in this manner, the VSIDs in the recycle list can be transferred to the free list, since all of their associated page table entries have been removed." (Col. 7, lines 7-11).

Applicant respectfully submits that independent claim 1 of the present application, as currently amended, makes it clear that registering that the virtual address space previously available to the process is no longer valid for the process occurs dynamically in real time because such registering is triggered by detection that the physical address space that was being used by processes associated with the device has been released and that the registering occurs as the physical address space

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is released. Support for amending claim 1 with this element can be found in the last sentence of paragraph 0057 in the specification of the present application as originally submitted. Further support can be found in paragraph 0064, which recites that "the memory management system of the OS will continually want to make released address spaces available to other processes."

Hence, the elements of claim 1, as currently amended, are distinguishable from the Dirks reference, which appears to describe free addresses being provided at regular intervals and after all the entries in the page table have been examined. As such, the Dirks reference appears to teach away from registering that the virtual address space previously available to the process is no longer valid for the process occurring dynamically in real time as triggered by detection that the physical address space that was being used by processes associated with the device has been released and that the registering occurs as the physical address space is released.

Moreover, contrary to the Examiner stating with regard to claim 18 that the Arimilli reference discloses in column 7, lines 43-57, that "the program instructions execute to set a bit in the region [sic] of the virtual memory data structure to indicate that the virtual address space is not available for use", Applicant respectfully submits that such a disclosure is not present in the cited section of the Arimilla reference, nor anywhere else therein. Nor does such an element appear to be disclosed in the Dirks reference.

Accordingly, Applicant has amended independent claim 1 to clarify that to register is performed by providing an indication in the virtual memory data structure for the process that the virtual address space, previously available to the process, is no longer valid for process.

Support for such an amendment can be found in the specification of the application as originally submitted. For example, the last sentence of paragraph 0053 recites:

program embodiments, as described herein, can execute to set a bit, several bits, flag, or other suitable identifier in one and/or a combination of data structures in the virtual data structure to mark that a virtual address space is no longer available for use by the process while maintaining a representation of the object associated

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with the process in the virtual memory data structure 306-1, . . . ,  
306-N associated with the process as illustrated in FIG. 3.

Applicant's independent claim 8, as currently amended, presently recites:

register by providing an indication in the virtual memory data structure for the process that the virtual address space is no longer available to the process;

wherein to register is triggered by detection that the physical address space that was being used by processes associated with the device has been released; and

wherein to register occurs as the physical address space is released and before release of the virtual address space by the process.

Independent claim 19, as currently amended, presently recites:

providing an indication in the virtual memory data structure for the process that a virtual address space is no longer available for use by the process as triggered by detection of a physical address space used by the process being released and when the object is removed from physical memory, without removing the representation of the object from the virtual memory data structure for the process.

Independent claim 22, as currently amended, presently recites:

at the release of the physical address space used by the process and before the process has released the virtual address space, registering an indication in a virtual memory data structure for the process that the virtual address space is not available to the process in a manner which does not violate semantics of an operating system.

In addition, independent claim 23, as currently amended, presently recites:

at the release of the physical address space used by the process and before the process has released the virtual address space, registering an indication in a virtual memory data structure for the process that the virtual address space is no longer available to the process in a manner which does not violate semantics for an operating system the computing device.

As such, Applicant respectfully submits that the presently claimed invention is neither taught by, nor made obvious in view of, the combination of the Arimilli and Dirks references. Accordingly, Applicant respectfully requests reconsideration

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and withdrawal of the 103 rejection of independent claims 1, 8, 19, and 22-23, as currently amended, as well as those claims that depend therefrom.

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**CONCLUSION**

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicants' attorney Edward J. Brooks III at (612) 236-0120 to facilitate prosecution of this matter.

At any time during the pendency of this application, please charge any additional fees or credit overpayment to the Deposit Account No. 08-2025.

**CERTIFICATE UNDER 37 CFR §1.8:** The undersigned hereby certifies that this correspondence is being transmitted to United States Patent and Trademark Office facsimile number (571) 273-8300 on this 28 day of February 2008.

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